

CLAIMS:

1. A vehicle cooling device for radiating the heat using a refrigerant comprising:
a main valve for controlling a flow distribution of the refrigerant distributed to a radiator and to at least one of conduits among conduits where the refrigerant flows bypassing the radiator in accordance with a valve opening degree;
a thermo element for varying the valve opening degree in accordance with the temperature of the refrigerant, the thermo element including a temperature sensing portion;
a water pump for circulating the refrigerant via the main valve, the water pump including an inlet;
a radiator conduit provided downstream of the radiator;
the inlet of the water pump and the radiator conduit arranged being opposite to each other along an operational direction of the main valve; and
the temperature sensing portion of the thermo element positioned at the inlet side of the water pump relative to the main valve.

2. The vehicle cooling device according to Claim 1 further comprising:
a fluid chamber behind the main valve provided downstream of the main valve; and
a first flow directing mechanism for directing a part of the refrigerant flown in the fluid chamber behind the main valve to an external peripheral surface of the temperature sensing portion.

3. The vehicle cooling device according to Claim 1, further comprising:
a fluid chamber behind the main valve provided downstream of the main valve; and
a second flow directing mechanism for merging the refrigerant introduced along the external peripheral surface of the temperature sensing portion into the refrigerant flown in the fluid chamber behind the main valve.

4. The vehicle cooling device according to Claim 2, wherein the refrigerant flown in the fluid chamber behind the main valve or at the external peripheral surface of the temperature sensing portion is introduced to the inlet of the water pump.

5. The vehicle cooling device according to Claim 2, further comprising:

a housing including the thermo element therein, wherein
the housing is connected with the plural conduits where the refrigerant flows
bypassing the radiator; and wherein
at least one of the conduits is in communication with the fluid chamber behind the
main valve.

6. The vehicle cooling device according to Claim 2, further comprising:
a supporting member for supporting the temperature sensing portion;
a housing member provided at the temperature sensing portion;
a spring for biasing the main valve in a direction for reducing the valve opening
degree;
a spring supporting portion for supporting the spring; and
a housing including the thermo element therein; wherein
the first flow directing mechanism is unitarily formed with at least one of the
supporting member, the housing member, the spring supporting member, and the
housing.

7. The vehicle cooling device according to Claim 3, further comprising:
a housing member provided at the temperature sensing portion;
a housing including the thermo element therein; and wherein
the second flow directing mechanism is formed on at least one of the housing
member, the housing, and the main valve.

8. The vehicle cooling device according to Claim 2, further comprising:
a spring for biasing the main valve in a direction for reducing the valve opening
degree, the spring positioned coaxially with the thermo element on at least one of a
member including the first flow directing mechanism and a member including the
second flow directing mechanism; and
a coil end accommodating portion for accommodating a coil end of the spring.

9. The vehicle cooling device according to Claim 2, wherein the first flow
directing mechanism is positioned downstream of a merging portion of the radiator
conduit and at least one of the conduits where the refrigerant flows bypassing the
radiator in a peripheral direction of the housing including the thermo element therein.

10. A thermostat comprising:

a main valve for controlling a flow distribution of the refrigerant distributed to a radiator and to at least one of conduits among conduits where the refrigerant flows bypassing the radiator in accordance with a valve opening degree;
a thermo element for varying the valve opening degree in accordance with the temperature of the refrigerant, the thermo element including a temperature sensing portion;
a housing including the thermo element therein, the housing including an opening end;
a radiator conduit provided downstream of the radiator;
the opening end of the housing and the radiator conduit arranged being opposite to each other along an operational direction of the main valve via the main valve; and the temperature sensing portion of the thermo element positioned at the opening end side of the housing relative to the main valve.

11. The thermostat according to Claim 10, further comprising:

a fluid chamber behind the main valve provided downstream of the main valve; and a first flow directing mechanism for directing a part of the refrigerant flown in the fluid chamber behind the main valve to an external peripheral surface of the temperature sensing portion.

12. The thermostat according to Claim 10, further comprising:

a fluid chamber behind the main valve provided downstream of the main valve; and a second flow directing mechanism for merging the refrigerant directed along the external peripheral surface of the temperature sensing portion into the refrigerant flown in the fluid chamber behind the main valve.

13. The thermostat according to Claim 11, further comprising:

a supporting member for supporting the temperature sensing portion;
a housing member provided at the temperature sensing portion;
a spring for biasing the main valve in a direction for reducing the valve opening degree;
a spring supporting member for supporting the spring; and wherein

the first flow directing mechanism is unitarily formed on at least one of the supporting member, the housing member, the spring supporting member, and the housing.

14. The thermostat according to Claim 12, further comprising:
a housing member provided at the temperature sensing portion; wherein
the second flow directing mechanism is formed on at least one of the housing member, the housing, and the main valve.

15. The thermostat according to Claim 11, further comprising:
a spring for biasing the main valve in a direction for reducing the valve opening degree, the spring positioned coaxially with the thermo element on at least one of a member including the first flow directing mechanism and a member including the second flow directing mechanism ; and
a coil end accommodating portion for accommodating a coil end of the spring.